

Computer Software Training and HRD: What are the Critical Issues?

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The paper explores critical issues for HRD practice from a parsonian framework across the HRD legs of organizational development, adult learning, and training and development. Insights into the critical issues emerge from this approach. Identifying successful transfer of training to be critical for organizational, group, and individual success. Systems such as email, enterprise resource planning (ERP), and videoconferencing help create insights into some of the critical issues.

Key Words: Training, Computers, Technology

Statement of the Problem

The world is an increasingly technological place for business, business functions, and business people. Thus, if we can improve how we train people to use computer software we can achieve better productivity and output. The problem is that our current training seems to lack successful training transfer of key skills.

Theoretical Framework

A Parsonian framework of Adaptation, Achievement, Integration, and Identity will be used. (Parsons, 1952, adapted by Callahan). This framework will set against Human Resource Development areas of the individual, group, and organizational levels. The goal of using these theoretical frameworks is to delineate, and discuss critical issues within computer software training for HRD professionals.

Research Questions

1. What are the major issues in training people to use computer software?
2. What contributes to effective learning?
3. What promotes transfer of the training to the workplace?
4. How do we go from current practice to a better practice

Literature Review

Parsons framework of adaptation, achievement, integration, and identity is being used as framed by Callahan during a critical issues class. Parsons original “goal attainment” was modified to achievement, and “latent pattern maintenance” was modified to identity. The HRD focal areas of the individual, group, and organization will provide some contrast points for the discussion. First, the general theory background of computers, technology in organizations, and computer applications for the workplace will be covered. Then, the paper will cross each area of the parsons framework with the three HRD levels. Insights into the critical issues developed during the discussion will be further clarified in the conclusions.

Technology in the workplace has continued to evolve and change the meaning of work. Many interactions in the workplace have changed. The personal computer, and its common presence in the modern workplace is a key driver of this change. The interface between the individual and the technology is one key element. (Oskamp & Spacapan, 1990). The reactions to technological change in the workplace create different emotions or affective states that will either be positive or negative to workplace relationships within the organization. Successful changes in workplace technology can help to create good moral. Likewise, poor implementation of these changes could result in negative performance for the work group or entire organization.

The affective or emotional component may be important to understanding how people put data into some order to create information. Goldratt discusses this problem in the “Haystack Syndrome” (1991). The modern workplace frequently generates many different measures, and literally can bury people under data.

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Technology increases our choices in how to organize information and information flows. Borgman states that “Information technology, however, has enlarged the space of our choices to an extent where it has lost all structure and resistance” (Borgman, 2000 p139). Thus, some of the characteristics of how organizations collect and handle information have changed. This may compound issues. Decisions on which measures and metrics to use and how long to hold onto data are likely to create impacts on other things in the system. The secondary effects are seldom apparent at the outset of a project.

Hertzke & Olson(1994) argue that education should make the student economically competitive. Therefore, there is a push to put computer technology into curriculum across the educational experience. Through shifting basic computer education into schools, organizations can reduce their training expense. What does economic competitiveness mean? In the sense used here, it most likely means to make students technologically competent in relation to their peers. In this way, organizations will at least have a basis from which to train their employees and new hires as systems and technologies continue to change.

Berkhardt (1994) examined social interaction following technical changes within the corporate environment. Her findings concluded that the social context does affect the attitudes, beliefs, and behaviors of employees. This finding is important to understand. Each technical change will have many ripple effects. Like a stone thrown into a pond, each of these ripple effects needs to be noted. Some of them may need to be addressed. However, others may be inconsequential. Everything in a system affects everything else (Von Bertalanffy, 1966).

Compeau and Higgins (1995) looked at computer self efficacy as one factor in persons decision to use computer technology. Self Efficacy (Bandura, 1997) has an ongoing relationship to successful training and organizational development programs. Does a person believe they can achieve something? Through believing in their abilities, and through previous positive experience the individual has a better likelihood of success.

Bartel and Sicherman (1999) examined wage differentials for workers with technology skills versus those without technology skills. They found a high wage differential exists for these workers. This study forms an economic rationale for why adult learners would seek to learn these new skills and abilities. The results of the study imply that workers with these skills are more valuable to the organization than workers without the skills. The subtext is that organizations know they are changing in the direction of greater technology, and to enhance their ongoing shift toward higher levels of technology integration, they will prefer to bring in people that already have these skills.

Charney, Reder & Kusbit (1990) completed one of the only direct comparisons of teaching methods for a software application. They looked at four ways of teaching electronic spreadsheets and completed a classic experimental design over a two day period. This study supported the thesis that current practice is not the best practice.

Participatory cognition (Fogel, 1993 p122) has been defined through the individuals’ transactions with the environment. Cognition then forms a basis for understanding and learning to occur. Cognition, is also the study of how we think. What ideas form in our heads. How do those “a ha” moments actually occur, and why do they occur so often when we are engaged in something other than the problem. Cognition’s role in looking at technology within the confines of HRD and the parsonian framework is important. We have to develop an appreciation for the way cognition interacts with other phenomena.

Discussion

The economics driving technological change are complex. In general a strong driver in the for profit sector is the goal of profitability. Another could be the increasing level of globalization for multinational firms. Training employees to use technology efficiently allows for greater business integration than older technologies allow. Entry-level executives doing their own typing on the personal computer also gain cost savings. Employing fewer people saves money for the organization. Using technology to integrate research and product development teams allow organizations to keep people working on a problem continuously by having global teams pass information forward at the end of their day to the next location at the start of their day. Employees are now expected to arrive with a base level of competence in current technologies so that organizations may minimize additional training costs.

Supply chain integration software allows firms to outsource various component parts with a reasonable assurance that the parts will arrive just in time for the assembly process. These cost cutting moves may be combined with software tracking of quality in real time on various critical measurements. In the supplier factory, the continuous quality monitoring may allow adjustments to the process before any defects are produced. In the globally interconnected world, each component part must be good quality. This places additional stress on organizational systems because to maintain the relationships in the supply chain the organization must be able to deliver on it’s

promise. The implication for successful training on systems is that the very survival of the organization depends on it.

The HRD profession has three legs. Organization development, adult learning, and training and development are the three cornerstones of HRD (Swanson & Holton, 1995). When we look at technology issues under the 4 parsonian dimensions and across the three legs of HRD, it is clear that technology competence has a high impact.

Adaptation

When we look at adaptation for technology a key issue of the pace of change emerges. The rapid pace of change means that many firms have at least some departments with out dated equipment, practices, or procedures. However, to balance the costs of acquisition these organizations also cannot purchase all new systems each year. Also, changes in practices or procedures represent organizational cultural shifts. The culture affects of the changes also have to be managed for change to be successful. Organizations adapt to changes in business conditions, worker skills and availability, and cost factors.

Each successful adaptation by one firm in an industry creates a ripple effect of decisions by others in the industry. The decision to change creates secondary effects in cost outlays for the change, implementation, and the resulting benefits. These adaptations frequently relate to implementing new technology. The promise of technology has been difficult to measure. The assumption is that productivity is increasing because of our use and integration of technology. These adaptations have many aspects that affect organizations in many ways. The organizational development side of adaptation is one such aspect.

HRD professionals provide organizational development (OD) guidance. The OD interventions may be designed to create a better work environment with the ongoing technological improvements. Organizations face many challenges in adapting to new technologies. Many technologies have both a positive and a negative side. The implementation may thus improve some organizational issues, but create new negative organizational issues. E-mail is a communication tool and is one such technological change. Patricia Wallace in "The psychology of the internet"(1999) states, "we don't just appear a little cooler, testier, and disagreeable because of the limitations of the medium. Online, we appear to be less inclined to perform those little civilities common to social interaction" (p.17). E-mail is a business document, but it is seldom created with the formality of a memo. Thus, people are more likely to send one quickly and with less thought. This has led to trouble for companies because when email is sent or received at work it is an official business document. Thus, while lawyers used to look for the "smoking gun" memo, now in the new world they closely examine email communications. Also, most email users do not realize that deleting the message from your inbox only deletes it from your machine. Many business and organizational computer systems are designed to capture and archive email onto the server. The implication is that we must develop the organization through adaptation to new technologies.

Training and development are obviously a key part of integrating technology within organizations successfully. Adapting the training to learner characteristics, backgrounds, and needs may help HRD professionals be more effective. Greater effectiveness may aid in successful transfer of the training to the workplace. The current approaches to technology training should be revisited. Many people find the classes either overly simplistic, or too guided. Perhaps this is because most of the texts have step by step handholding for the assignments. Cognitively this activity does not seem to make the transition to long term memory. Frustrations with learning style mismatches, and learning approaches may discourage some learners. HRD professionals may need to find transitional hands on activities for learners to successfully gain these skills.

Adult learning concepts may help the HRD professional in these endeavors. Adults have different learning characteristics (Knowles, Holton, and Swanson, 1998; Kolb, 1976). The adaptation for adult learners is said to take more time than for traditional pedagogical learners. Thus some of the impacts for HRD from an adaptation perspective are that we may need to give adult learners more time to understand concepts and we may need to change the way in which we practice skills to help the students take charge of the steps within a process.

Achievement

The achievement quadrant of the model focuses on individual group and organizational processes. What do we mean by achievement? Reaching goals on time, and exceeding goals are parts of achievement. How we set goals is also part of achievement. Technology training affects these processes at all three HRD levels because of the organization coordination software common today. There are many vendors of enterprise resource planning software (ERP). Each of these packages typically can import or export data to other software seamlessly. The advantage of the software is to coordinate and communicate between people and places. The challenge to the organization is not as simple as providing training to use the software.

Achievement is frequently both a goal for individuals as well as organizations. The promise of technology is to enable the organization to achieve more while using fewer resources. Essentially, the promise underlying the successful implementation of technology is that productivity gains, cost savings, quality improvements, and time savings will all occur because of the new process, method, system, or computer we are installing. The organizational development opportunities are obvious. HRD professionals design new ways to make the organization work better. The HRD professional then implements the organization development intervention. If all works well the changes take root in the corporate culture. The changes then grow into their fullness, and sprout leaves and flowers. If metaphors for smooth results held true, then HRD professionals would probably not exist at all. It seems that in many cases, the designed implementations for organization technology changes are either un used or under-utilized. For example, although many people have computers on their desks in the work environment, are they making good use of the technology to assist them in their daily tasks and routines? Achievement is measured by our results. Thus, for organizational development through increased technology we would measure profits within business firms.

Achievement affects when technology is examined through training and development are perhaps clearer. All new systems require training. The people directly interacting with the technology need to be brought up to speed. The interfaces with other outside organizations or internal clients needs to be clarified. The technology may be evolutionary or revolutionary. The training for evolutionary steps in technology is arguably easier because the underlying system is either the same, or still quite similar. Revolutionary technology implementations would create a entire new way of doing something. An old example would be the switch from vacuum tube electronics to transistor based "solid state" electronics. Revolutions in processes for how to build radios and televisions followed. Now, the very last common type of vacuum tube electronics is starting to be replaced by advanced liquid crystal displays (LCD), and plasma flat panel displays. The cathode ray tube (CRT) found in monitors and televisions represents the last common vacuum tube. Achievement, and goal attainment may be affected most by this simple shift in computer displays. In many offices the desk space occupied by the monitor was quite large. The flat panel display will allow workers to reclaim thousands of square feet of desk space at large organizations.

Achievement with technology when examined under adult learning gives us different insights. Adult learning has personal goals for success rather than organizational goals. Learning how to use new and varied technology may allow people to create their own web pages. People may learn how to send images through the internet. They may take four pictures of their child and make an animated gif file to either email as an attachment or to post on a family web page. Each of these may represent a personal goal for the individual.

Integration

Technology implementations require integration within the business process. Enterprise resource planning software is designed to tie different packages together and make them accessible to top management through a easy to use system. The integration of these technical software packages happens in the background via database operations, and custom written code. SQL is a database query language, and a tool for some of these operations. The HRD professional must be aware that integration of the technology not only to other technologies but also to business systems, operations, partners, and alliance members is a critical issue.

From the organizational development perspective, technology integration is fundamental. Organizations are increasingly far flung enterprises. The coordination, control, and communication between segments of the organization is critical for success. Organizational development programs make changes at the level of the organizational system. This is where the greatest gains can be achieved, but also where there is some risk. The gains for changing the organizational structure include: profits, gains in market share, reduction in prices, and improvements in quality. This is the promise of effective choices for technology, and effective implementation. The risks? A choice of technology that does not result in promised gains is not the largest problem. A bad choice resulting in data or information being lost would be very damaging to an organization. For this reason many companies and organizations go through a period of keeping the old system live. This necessitates entering all transactions twice. While bothersome, this does give an organization a dual system for a short time, while the new system may be verified as accurate.

Training and development for technology is also a key part of integration. How does any organization go about integrating something? The organization must develop training and implement the technology shifts to that they may enhance integration of the enterprise. The training program for achieving integration must examine the system as a whole. This is the level of focus for integration. The technologies prevalent in creating the integration between the distant parts of the organization must be available, reliable, and relatively easy to use. People ultimately interact with each other through technology. Therefore, the technology is an enabling device to enhance the communication for the organization. It is only through this enhanced communication that the organization can be integrated to the extent necessary for success.

Integration from the perspective of adult learning is complex. Because integration of the organization occurs through people communicating, each adult learner in the complex system must become comfortable with the enabling technologies. Thus, the technologies positive and negative characteristics need to be included within the adult learning program. These characteristics, such as the impersonal nature of email noted earlier, affect the effectiveness of the organization. The adult learners may not realize that using all capital letters in an email is considered shouting (Hale, 1996). They may not realize that the impersonal nature of email tends to result in an overall abruptness to most emails. They may not realize that videoconferencing software creates a distance that lends itself more to dictating terms, than to discussion or dialog. These issues need to be a clear part of the adult learning programs for technology integration within organizations.

Identity

The notions of who the organization is, what it represents, what it stands for, are all-important. The technology organizations choose to make use of also affect their corporate image. If they choose to use Apple computers then the office image may be individualistic, unique, and even collective. How could this be both individualistic and collective? They are individualistic in the sense that they are going against the dominant computer platform. Yet, Apple computer users tend to be quite group oriented when considered together. They are bonded. This unique identity of apple computer users represents an unusually high brand loyalty.

How does technology affect identity? The choice of technology is complex. Organizational identity is also a complex topic closely tied to the organizational culture. Within the culture there will either be a general preference for technology or a general distrust or dislike. The organization helps to create this preference through their own choices. The identity of the organization begins with their history. Where have they been? The technology within an organization has it's own history. There are organizational legends. One legend could be that software and systems are still in use long after they were initially written. Some of these represent code that has been patched so many times that the documentation no longer exists. While some adjustments or modifications to software or systems may be considered minor, after several years these could accumulate to create something that no one understands anymore. The identity, purpose, and goals of the software would get lost under such a scenario.

Organizational development of technology helps create the identity of the organization through forming a cornerstone within the resources of the firm. The resources technology integrates allow individuals within the organization to perform at a higher level. This in turn creates it's own positive self affirming upward spiral for the identity of the firm. It is possible for the opposite to occur.

A corporations' identity as a front-runner, could be negatively affected by cutting budgets for technology. The phone systems could no longer connect with real people. The customers, when only getting automated responses could become frustrated. The cutbacks could cause the systems to perform slowly. The low performance of the system could result in a depressed staff. The extra time it takes to complete tasks would increase the stress and frustration on the employees. All of these factors would then contribute to a negative downward spiral leading to a very negative organizational identity. Organizational development for identity must consider technology issues as an ongoing critical issue

Table 1. Critical Issues and Insights for HRD through a Parsonian Lens

HRD issues for software training	Adaptation	Achievement	Integration	Identity
Adult Learning	New systems require new change. Individuals frequently find change difficult	Individual growth in building technical skills Small steps in improving competence	Each individual must learn to integrate with the group. Coordination and cooperation are aided by E-mail and videoconferencing	Part of our identity may be lost through virtual selves. We may gain a new identity from a technical competence lens
Training and Development	Hands on training needs to enhance learners long term memory retention	Skills need to be transferred to the work environment	ERP software helps tie organizations together when well implemented E-mail creates new ways of interacting and new training requirements	Organizations develop an identity as technology leaders or laggards

Organizational Development	The changes organizations are going through with globalization place unique challenges on HRD in terms of training people to successfully use new systems	Traditional measures such as profitability will continue to be important. Successful changes in systems and linkages will be important secondary measures	ERP software helps facilitate integration and implementation of Just in Time systems, while aiding organizations in Total Quality Management	The customer relationship management (CRM) decisions involving technology will impact the publics' image of the organization either positively or negatively
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Conclusions

Adaptation, achievement, integration, and identity are different perspectives of a whole. Organizations have many dynamic interactive systems operating inside, outside and across them. Each perceptual lens that we view organizations through will allow us to view the reality slightly differently. These four parsonian lenses were further broken up by the human resource development areas and discussed. The three core areas of HRD helped to develop insights into critical technology issues for organizations and the HRD profession

Many challenges face organizations as they change and update socio-technical systems. As globalization continues to grow with organizations seeking a part of the 6.3 billion consumer market of the world, and world trade continues to seek lower tariffs and fair trade among countries organizations will have to coordinate and control larger operations. Current global organizations such as Unilever, Proctor and Gamble, as well as automotive sector organizations use planning software, and electronic linkages along both their supply chain and distribution channel. Effective transfer of training to the workplace for effective use of these systems is likely to continue to be a critical issue for global HRD practice.

Contribution to HRD

Human resource development faces many challenges within technology frameworks. From a software and organizational training perspective this research helps to clarify some of the critical issues in HRD organizational development efforts. Customer relationship management (CRM), enterprise resource management (ERM), and other complex software systems help organizations improve their productivity only to the extent that organizations can successfully implement the software. HRD professionals play a key role in these ongoing organizational change efforts because of our key expertise in working with people in change processes. One of the first challenges in any change is to understand the system. Through the parsonian framework and lenses of adult learning, training and development, and organizational development this paper has explored issues in the current system and practice.

Human Resource development represents the central function of organizations ideally suited to address the critical issues discussed. Organizational development efforts tie HRD interventions to new modes of workplace interaction based on technology. This centrality of HRD to changing the organization puts HRD practitioners and theorists at the center of the adaptation efforts for organizations.

Training and development efforts in HRD tie practitioners directly to the issues of effective redesign of workflow, processes, and technology. Working with individuals to develop the new skills sets required by the organization is part of the new increasingly technical world. HRD is uniquely suited to improving the current practice of software technical training.

Adult learning concepts within HRD may help the field successfully change the common practices in software applications training. Understanding adult learner needs may help HRD to develop the theoretical underpinnings of new approaches to systems improvement and changes that are based on successful implementation and use of software.

Overall, HRD will benefit from the critical issues identified in the paper through the new conceptual lens provided by parsons framework. The lens helps to clarify ways we may operationalize further research into the phenomena. Any issue or phenomena will appear somewhat different depending on how we frame it or the lens through which we view it. Thus, this paper has provided a new lens for viewing issues surrounding the phenomena of implementing enterprise resource planning software (ERP), customer relationship management software (CRM), materials requirements planning software (MRP), and others. Organizations currently use many such software designs to aid in improving efficiency and effectiveness. HRD's performance and learning paradigms contribute to the theory underpinnings for further research in this area. However, additional layers of theory and practice are

needed to further clarify and develop our understanding of how these software systems are driving and allowing new change in organizations.

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